

What is claimed is:

1. A method of switching a binary digital signal having a discrete power level from a single input optical fiber to at least one output fiber comprising the steps of:

providing an input signal into an input optical fiber;

splitting said input signal to form a plurality of split input signals;

selectively amplifying at least one of said plurality of said split input signals with an amplifier; and

attenuating each of said plurality of said split input signals after said step of selectively amplifying.

2. The method of claim 1 wherein said splitting said input signal is repeated in a binary fashion N times to produce  $2^N$  split input signals.

3. The method of claim 1 wherein said selectively amplifying is accomplished through the use of a semiconductor optical amplifier.

4. The method of claim 1 wherein said selectively amplifying is accomplished through the use of an erbium doped optical fiber pumped by a laser.

5. The method of claim 1 wherein said selectively amplifying is accomplished through the use of a controller.

6. The method of claim 1 wherein attenuating each of said plurality of said split input signals comprises filtering said split input signals.

7. The method of claim 1 wherein attenuating said plurality of said split input signals comprises the step of passing said split input signals through a partially opaque section of fiber.

8. A fiber optic switch comprising:

an input optical fiber capable of transmitting an input signal;

at least one splitter joined to said input optical fiber for splitting said input optical fiber to form a plurality of split optical fibers, each of said split

optical fibers being capable of carrying said input signal;

at least one amplifier joined to each of said plurality of said split optical fibers, each amplifier being controllable to amplify the signal in the joined one of the split optical fibers; and

at least one attenuator joined to each amplifier to attenuate the signal in each of said plurality of said split optical fibers.

9. The switch of claim 8 wherein said at least one splitter is arranged in a binary fashion  $N$  times to produce  $2^N$  split optical fibers.

10. The switch of claim 8 wherein said at least one amplifier is a semiconductor optical amplifier.

11. The switch of claim 8 wherein said at least one amplifier is an erbium doped optical fiber pumped by a laser.

12. The switch of claim 8 further comprising a controller joined to said at least one amplifier for selectively controlling the joined amplifier.

13. The switch of claim 8 wherein said at least one attenuator is an optical filter.

14. The switch of claim 8 wherein said at least one attenuator a partially opaque section of fiber.